Amendments to the Drawings

Attached hereto is a replacement sheet that adopts the changes proposed by the Examiner.

REMARKS

In response to the objection to the drawings, attached hereto is a replacement sheet that adopts the changes proposed by the Examiner.

In response to the objection to claim 9, "electric-resistance" has been changed to "electrical".

Reconsideration of the rejection of claims 1-10 under 35 USC 103 as being unpatentable over Rolinski in view of Smith is respectfully requested. The measuring device according to the present invention is used to determine the radiant heat flux absorbed by a test specimen in a fire test apparatus. Such a test specimen has an area exposed to radiant heating and is held in a specimen holder and coated with a coating to simulate the heat absorption of a material or object during a fire. In order to avoid the introduction of errors in the measurement, the measuring device according to the present invention is made like the specimen, coating and holder whose heat flux the measuring device is intended to measure. Thus, claim 1 recites the measuring device as comprising a body having a coating that is the same as the coating on the specimen. This is disclosed in the application at, for example, paragraph 00004 on page 1, paragraph 00007 on page 4 and paragraph 00015 on page 5.

In contrast, Rolinski does not suggest that a coating of its copper plate be the same as a coating on a test specimen, such as a laser hardened material specimen. There does not seem to be any suggestion in Rolinski that a test specimen have any coating.

By the present amendment, claim 1 has been amended to call for the measuring device to also comprise a holder that is the same as the specimen holder in which the specimen is held. This is disclosed in the application at, for example, paragraph 00016 on page 6.

In contrast, although Rolinski describes a mounting plate for the copper plate, it does not

seem to disclose a holder for a test specimen, much less that a holder for the copper plate be the same as the holder for the test specimen.

In addition, claim 1 calls for an electrical heating element free from interposition, between the heating element and said body, of the coating on said body. In contrast, the anodization of the copper plate of Rolinski is not disclosed as being absent from between the plate and a heater, and so, in Rolinski, there is no freedom from interposition, between a heating element and a body, of the coating on the body, as has been required by claim 1.

Similar to Rolinski, Smith does not suggest that the coating on its target module be the same as a coating on a test specimen. There does not seem to be any suggestion in Smith that a test specimen, such as cake or pizza, have any coating. Smith does disclose the use of coatings on the target 30 to simulate the thermal characteristics of the process product, but this is not the same as having a test specimen that has a coating and providing the measuring device with a coating that is the same as the coating of the test specimen. Furthermore, the coating of the target 30 of Smith is not disclosed as being absent from between the target and a heater, and so, in Smith, as in Rolinski, there is no freedom from interposition, between a heating element and a body, of the coating on the body, as has been required by claim 1. Thus, even if Smith had been combined with Rolinski, not all of the claimed features would have been present and the public would not have been given the knowledge of the present invention.

Moreover, it is submitted that it would not have been obvious to modify Rolinski in view of Smith in the manner set forth in the Office Action. The modification involves taking a few isolated features from Smith while leaving behind all of the other features of Smith, with the only incentive or rationale as to what to take and what to leave behind being provided by the present application.

In view of the foregoing, it is submitted that claim 1 is allowable over the prior art. Independent claim 10 is like claim 1 except that claim 10 recites "an electrical heating means" instead of "an electrical heating element" and "means for indicating the temperature of the body" instead of "a thermal detector indicating the temperature of the body". Thus, it is submitted that claim 10 is also allowable over the prior art.

Claim 2 depends on claim 1 and calls for the body to have an area exposed to radiant heating that is the same as the area of the specimen that is exposed to radiant heating. This is not disclosed in the prior art.

The device of the present invention is fundamentally different from the prior art. The Rolinski patent mentions in passing the use of an anodized coating of the copper plate holding a set of Gardon heat flux gages. However, none of the measured heat flux actually goes through the anodized coating. Instead, the heat flux that is actually measured only goes through the Gardon gages. The Rolinski invention would work equally well in the absence of any coating. Thus, the coating is irrelevant. In contrast, the device of the present invention has the ability to work with different specific types of coatings. The measurement results depend on the specific coating, and the present invention is specifically designed to determine, for a given coating and given setting of the radiant heater, the heat flux that is absorbed by (and penetrates through) the specified coating.

Rolinski includes an electrical heater that preheats a heat transfer calibration plate prior to the measurement. In column 3, lines 5-14, it states that the heater is first energized until the temperature reaches 200 -250 deg. F, at which point it is switched off. The rate of heating is unimportant. Then, the recorder is turned on and the ambient pressure, ambient temperature, plate temperature and heat fluxes through the Gardon gages are continuously recorded to

determine the local heat transfer coefficient "h". Thus, the heater is simply used to preheat the calibration plate. It is not an integral part of the measurement itself. One could preheat the plate by other means. In contrast, the electrical heater is an integral part of the present invention. One first applies the radiant heaters at a given setting and measures the *temperature-time* curve with the electrical heater turned off. Then one measures the *temperature-time* curve several different electrical heater power levels with the radiant heaters are turned off. Finally, one finds (by interpolation) the electrical heater power, working alone, that exactly replicates the *temperature-time* curve that was produced by the radiant heaters working alone without electric heating. By so doing, one finds the electric heater power that exactly matches the particular setting of the radiant heaters. An accurate measurement of power to the electric heaters is needed for the measurement. It allows one to measure the net radiant heat flux that is absorbed without the effects of heat losses due to convection, reradiation rising from the heated surface, conduction heat loss to the holder, and even the effects of reflection and scattering of original incident radiation from the radiant heaters. The measurement device of the present invention is explicitly designed to overcome the effects of all the above various heat losses. In this regard and others, it is truly novel. The present invention offers a significant advance in the state-of-the-art of heat flux measurements. Neither Smith nor Rolinski measure the power supplied to the electrical heater as an integral part of their measurement of heat transfer.

Rolinski mentions an insulated holder. Such an insulated holder is helpful but not essential to the Rolinski invention. The details of the insulated holder are not important. In contrast, the details of the insulated holder for the present invention are important. The details of the latter must be identical to those of the specimen holder, if one is to eliminate the effects of conduction errors. There is always some conductive heat loss to the rear and sides of the present invention.

By making the holder the same for both device and specimen, one virtually eliminates their effect on the final calibration.

The present invention has at least the following novel features:

1. The ability to measure the absorbed (rather than incident) radiant heat transfer for an arbitrary coating in a fire test apparatus.

2. A convenient device for calibration of fire test apparatuses for making measurements of absorbed radiant heat transfer apparatus independent.

3. By (a) the device being made virtually identical to the specimen with its coating and specimen holder and by (b) matching the *temperature-time* curves for power supplied to the embedded electric heater to the *temperature-time* curves for radiant heating alone, the absorbed radiant heat flux without interference from the effects of radiative, convective and/or conductive heat transfer losses is accurately determined.

In view of the foregoing, applicants submit that all the claims presently pending in the application are allowable and that the application is in condition for allowance. An early notice to that effect is respectfully requested.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0562.

Respectfully submitted,

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